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Parental Report of Receipt of Adolescent Preventive Health Counseling Services from Pediatric Providers

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Abstract

Objectives—Little is known about prevention-focused counseling health providers deliver to parents of adolescents. This study compared parental report of discussions with their adolescents' providers about a range of adolescent prevention topics.

Methods—Between June and November 2009, a questionnaire was provided to parents accompanying adolescents aged 11–18 on outpatient clinic visits. Parents indicated, anonymously which of 22 prevention topics they remembered discussing with their adolescent's provider. Hierarchical logistic regression models were used to identify correlates of parental recall.

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Results—Among the 358 participants, 83% reported discussing at least one prevention topic. More parents reported discussing general prevention topics than mental health or high-risk topics (e.g. sex). Adolescent gender, visit type, having a usual source of care, and parental beliefs about their adolescents' risk behaviors correlated with parental report of discussions about high-risk and mental health topics.

Conclusion—Most parents recalled discussing one or more topics with their adolescent's health provider. However, parental report of discussions about topics linked to significant adolescent morbidity was low.

Practice implications—Strategies to improve the frequency, timeliness and appropriateness of counseling services delivered to parents about adolescent preventive health are needed. Strategies that utilize decision support tools or patient education tools may be warranted.

Keywords

Adolescent; health services; primary prevention; counseling; communication

1. Introduction

Adolescence is a relatively healthy **period of life**. Most adolescent morbidity is due to engagement in health risk behaviors¹. Screening and counseling adolescents about health risk behaviors is considered an important approach for promoting adolescent health. In addition, national guidelines recommend that health providers deliver prevention-focused **messages to parents, as well as to adolescents**^{2,3}. The American Academy of Pediatrics' "Guidelines for Health Supervision"⁴ and the Maternal and Child Health Bureau's "Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents"³ list age-appropriate prevention-focused topics that clinicians should discuss with parents. The basis for these guidelines is the belief that anticipatory guidance and prevention counseling delivered to parents improves children's health. Providing parents with age-appropriate information about their adolescent's health and development strengthens parents' ability to identify problems early and to seek help⁵.

While studies have examined the delivery of prevention counseling services in pediatric care, the majority focus on **anticipatory guidance delivered to parents during** early childhood⁶. Few have examined whether providers deliver prevention messages to parents of adolescents, the content of these messages, or the effect counseling has on adolescent health. Several qualitative studies have explored parental reports of whether such conversations have occurred. Two used focus group methodology to document parents' perception that providers rarely counsel them about adolescent preventive health issues^{7,8}. One **of these**, conducted among parents recruited from eight clinics that were part of a state-based adolescent research network, found that parents wanted providers to communicate with them **more** about adolescent preventive health issues⁸. **The other, a nationwide** study, noted similar results⁷. Although helpful, a major limitation of these studies is that they do not quantify provider counseling rates or variations in provider-parent counseling by topic. Such information would be immensely helpful for informing intervention efforts.

Delivery of prevention-based counseling services to parents and adolescents is recommended during annual well-child visits, which focus largely on health promotion. However, implementation of these prevention guidelines is difficult because fewer than 40% of adolescents attend an annual well-child visit^{6,9,10}. Instead, adolescents are more likely to present for acute care visits¹¹, during which delivery of prevention services is feasible, but rare¹². An additional challenge is that adolescents often present with multiple complaints, which limits physicians' time to provide risk screening and targeted counseling to adolescents or their parents.

Accurately assessing the provision of prevention counseling services to parents in pediatric practices is challenging. The most rigorous assessment method relies on audio-recording visits. This approach is time consuming, labor intensive, and expensive. Analysis of medical record documentation, billing records, or assessing recall by parents or providers can be used as proxy measures for clinician counseling behavior. However, the accuracy of each method is highly variable as demonstrated by studies examining delivery of counseling services to parents during early childhood¹³⁻¹⁵. These studies have found that medical record documentation has little concordance with directly observed physician counseling. For adolescent populations, billing records capture services delivered to adolescents, not parents. Studies employing parental report vary depending on the length of time since the clinic visit, visit type, and the child's age¹⁶. Despite these limitations of **using** parental report, a recent study demonstrated that parental recall is a time-**efficient** and cost-effective method with higher sensitivity than medical record review and good convergent validity with audio-recorded visits¹⁷.

In this study, we **administered a cross-sectional questionnaire** to parents in pediatric outpatient clinics at a large academic hospital to assess parental report of receipt of prevention-focused counseling about adolescent health issues from their adolescent's pediatric provider. To inform subsequent intervention efforts, **we examined** demographic, parenting, and health care utilization factors that were **potential** correlates of parental reports. Given the lack of data regarding the content of prevention messages delivered to parents of adolescents and the effect such counseling has on adolescent health, this study represents the first step in filling these research gaps.

2. Methods

Between June and November 2009, we **administered an anonymous, self-report questionnaire** to a convenience sample of parents accompanying their adolescent children on visits to the general outpatient pediatric clinics at the Children's Hospital of Pittsburgh. At the time of the study, the clinics had 25 providers and 19,000 unique visits annually. **Sixty-four** percent of patients **were black and 30% were** white, with few Hispanics or Asians (**2% and 4%, respectively**). **The questionnaire was administered** as part of a larger initiative to improve the provision of adolescent health promotion education to parents in pediatric primary care practices at the institution. The questionnaire sought to (1) identify adolescent preventive health issues of primary concern to parents of adolescents; (2) determine parents' preferred and actual sources for adolescent preventive health information; and, (3) assess parent and provider interest in computer-based delivery of

adolescent prevention-focused information to parents. This manuscript presents the findings for the first aim of the questionnaire only.

Biological or legally adoptive parents of adolescents aged 11 to 18 years were invited to complete the **questionnaire** if they were accompanying an age-eligible adolescent **on** a clinic visit. Parents were handed a recruitment postcard when they checked in for their adolescent's visit. The postcard directed parents to a research study booth in the waiting room, where research staff explained the study, **assessed eligibility**, and distributed the **questionnaires**. Parents completed the **questionnaire** in the waiting room prior to their visit. This was done to reduce bias based on discussions that **occurred** on the day of the study visit. A response rate could not be calculated due to restrictions from our Institutional Review Board (IRB) regarding our recruitment activities and access to detailed clinic visit data. The clinics do not collect data regarding the proportion of parents who accompany adolescents to appointments, and permission was not granted by our IRB to collect this information. Moreover, recruiters were only permitted to talk with parents who voluntarily approached the study booth after receiving a flyer from the clinic staff. Recruiters were not provided access to clinic data regarding the volume of patient visits by age eligible adolescents during the study period. These factors precluded determination of a response rate.

Data collection

The **questionnaire** was adapted from the School Health Promotion Initiative's Parent Survey¹⁸. **The changes made were to amend** the language to be consistent with **the questionnaire's** use in an outpatient pediatric clinic rather than a school-based, setting. **Items** were added to assess parental interest in computer-based **delivery of prevention** information. The 41-item, self-administered pen-and-paper **questionnaire** took approximately 15 minutes to complete. Parents returned the questionnaire to a locked box at the study booth and were then provided with a \$5 cash reimbursement for their time. Because **questionnaires** were anonymous and contained no identifiable or sensitive information, only verbal (not written) informed consent was obtained. The study was approved by the University of Pittsburgh **IRB**.

Main outcomes

Parents were provided with a list of 22 adolescent preventive health topics identified via review of national guidelines on adolescent preventive health services^{3,19-21}. This resulted in a broad list of topics that were then reviewed by a panel of pediatricians, adolescent medicine specialists, and an OB/GYN to create the list of 22 topics used. Parents were asked to indicate which topics they could recall discussing with their adolescent's provider. To reduce under-reporting bias, parents were asked to indicate whether they had ever discussed each topic, rather than limiting recall to a shorter timeframe. In our models, we adjusted for the length of time since the last clinic visit to reduce bias due to differential lengths of time since a last encounter with an adolescent's provider.

Among parents who recalled discussing at least one topic, principal components analysis was used to group topics into clusters. This was done to avoid multiple testing, which

increases type I errors²². We used a maximum likelihood iterative solution with the factors rotated to a varimax solution²³. A three-factor solution was found. Factor 1, named *High Risk* topics, included drug/alcohol use, sexual health topics (e.g., HPV virus, sexually transmitted infections (STI), teen pregnancy), and abuse²⁴. Factor 2, named *Mental Health* topics, included depression, stress, suicide, behavior problems, and smoking. Smoking commonly co-occurs with mental health diagnoses during adolescence²⁵. Factor 3, termed *General Prevention*, included body image, eating problems, exercise, HPV vaccine, nutrition, and safety. Four main outcomes were then created to reflect parental report of discussing (a) at least one adolescent preventive health topic, (b) high risk topics, (c) mental health topics, or (d) general prevention topics.

Covariates

Because recall might be influenced by demographic, healthcare utilization, or parenting factors, we examined each of these as potential correlates in our regression approach. Parent demographic factors included age, sex, race, marital status, education level, and parental relationship to the adolescent accompanied to clinic. Adolescent demographic factors included age, sex, and insurance status. Because prevention counseling services may vary according to an adolescent's developmental stage, adolescent age was divided into 3 developmental periods: early (11-13 years), middle (14-16 years) and late (17-18 years) adolescence.

Healthcare utilization factors included the visit type (e.g., well-child visit, immunization, acute illness, sport's physical, or referral), having a usual source of care (USOC), **whether** the study clinic was the adolescent's USOC, length of time **the** adolescent **had** been with their USOC, and the mean time since the last well-child visit.

Three parenting factors that have **been** consistently linked with adolescent health outcomes were assessed using validated measures. Parental social support was measured using a 12-item scale²⁶. Parental monitoring was measured with a 6-item scale²⁷. Parental communication was measured using a 10-item scale²⁸. Responses to each scale were summed, with higher scores denoting greater parental social support, monitoring, or communication.

Parents may be more likely to recall discussing preventive health issues with their adolescent's provider if the parent believes their adolescent has engaged in health risk behaviors. Thus, parents were asked to indicate whether they believed their adolescent had ever engaged in five risk behaviors (alcohol/drug use, tobacco use, sexual intercourse, condom or contraceptive non-use, or questioned **their** sexual orientation) or experienced two adverse reproductive outcomes (pregnancy or a **STI**). Responses were summed to create a health risk belief score, with higher scores denoting parental **belief** that their adolescent had engaged in more health risk behaviors.

Analysis

The distributional properties of all variables **were** examined. Stepwise hierarchical regression modeling was used to identify correlates of each of the four outcomes. Variables

were added to the models in groups to identify to assess the relative effect of different types of variables on parental recall. Prior to modeling, the correlation coefficient matrix showing the relationship **among** all pairs of covariates was examined. No pair of covariates had a correlation coefficient above 0.40, and most were less than 0.01. The possibility of multicollinearity among these variables was also examined, but was not found. Thus, all variables were included in the modeling process. In preparation for modeling, categorical variables with small cells were collapsed. Three categories were created for race (black, white, other), marital status (single/never married, married, separated/widowed/divorced), and education (< high school, some college/college graduate, graduate school). Two categories were created for the variables reason for clinic visit (well-child visit, other) and adolescent insurance (Medicaid versus private). Covariates were entered in a stepwise fashion, with demographics entered first (Model 1), healthcare utilization variables next (Model 2), and parenting factors, including parental beliefs about their adolescent's engagement in risk behaviors entered last (Model 3). Although we did not use model selection approaches to identify the best predictive model, Akaike information criterion and Bayesian information criterion were used to measure of the relative quality of the statistical models. These measures decreased with the higher-step models, indicating improved model fit. Analyses were conducted using STATA 11 (StataCorp, College station, TX). The significance level was set at $p < 0.05$.

3. Results

Table 1 shows the characteristics of the 358 participants. Most were female (89%). **Sixty one percent were black.** A third each were white (34%), single-never married (36%), and had completed some college (30%) or had a college degree (28%). Half (53%) **of adolescents** were female. Thirty five percent of the **adolescents were** early adolescents, 46% middle adolescents, and 17% late adolescents.

Most parents (83%) recalled discussing at least **one** adolescent preventive health topic with their **adolescent's** provider. The proportion who recalled discussing each topic is listed in **Table 2**. Parental recall varied widely, with some parents unable to recall discussing any topics (17%) and others able to recall discussing all 22 topics (6%). The mean number of topics parents recalled discussing was 6.6 ± 6.4 , and **the** median was 5 topics. More parents recalled discussing general prevention topics (74%) than mental health (65%) or high-risk (61%) topics ($p < 0.001$ for all pairwise comparisons).

Factors associated with parental report of discussions about more than one topic

Neither demographic factors nor any of the measures for healthcare utilization, parenting characteristics, **or** parental belief about adolescent engagement in risk behaviors **as associated with** parental report of **discussions about** a greater number of topics (data not shown).

Factors associated with parental report of discussions about high risk topics

When only demographic variables were adjusted for (Model 1), parents accompanying an adolescent female had twice the odds (OR 1.94; 95% CI: 1.18, 3.19) of reporting having

ever discussed high-risk topics compared to those accompanying an adolescent male (**Table 3**). Adjusting for healthcare utilization measures (Model 2) did not appreciably change the model results. After adjusting for parenting characteristics and parental beliefs about their adolescent's risk behaviors (Model 3), parents accompanying an adolescent female remained more likely to report having ever discussed high-risk topics (OR 2.20; 95% CI: 1.08, 4.50). **For every additional health risk behavior parents believed their adolescent had engaged in, the odds that the parent would report having ever discussed high-risk topics increased by 22% (OR 1.22; 95% CI: 1.01, 1.48).**

Factors associated with parental report of discussions about mental health topics

When adjusting only for demographic characteristics (Model 1), parental sex was associated with parental report of having ever **discussed** mental health topics (**Table 3**). Mothers were less likely to report **discussing** mental health **topics** compared to fathers (OR 0.43; 95% CI: 0.19, 0.97). After adjusting for clinic utilization measures (Model 2), parental sex was no longer significant, but visit type was. Parents accompanying an adolescent on a well-child visit had more than twice the odds (OR 2.28; 95% CI: 1.29, 4.04) of reporting having **ever discussed a** mental health topic compared to those accompanying **an adolescent** on another type of visit. After adjusting for parenting characteristics and parental beliefs (Model 3), **parents** accompanying an adolescent to a well-child visit still had more than twice the odds (OR 2.38; 95% CI: 1.17, 4.84) of reporting having **ever discussed a mental health topic**. If the study clinic was the adolescent's **USOC**, parents had three times the odds (OR 3.49; 95% CI: 1.37, 8.87) of reporting **ever having discussed a mental health topic** compared to those accompanying a child whose **USOC** was not the study clinic. Parents who believed their adolescent had engaged in a greater number of risk behaviors were more likely to report **having discussed a mental health topic** (OR 1.23; 95% CI: 1.03, 1.48).

Factors associated with recall of discussions about general prevention topics

Neither demographic factors nor measures for healthcare utilization, parenting characteristics, **or parents' belief about their adolescent's risk behaviors was associated with** parental report of **ever discussing** general prevention topics (**Table 3**).

4. Discussion and Conclusion

4.1. Discussion

To our knowledge, the current study is the first to quantify parental report of adolescent-focused preventive health counseling services delivered to parents by health providers. In a convenience sample of parents accompanying adolescents attending outpatient clinic visits at an urban, academic outpatient clinic, we found that parental report of having ever discussed at least one adolescent prevention-focused topic was high. However, parental report of discussions about each individual preventive topic was quite low. Moreover, parents were much more likely to recall discussing general prevention topics (e.g., physical activity and nutrition) than to recall discussing sensitive topics such as sex, substance use, or mental health issues. It appears that the topics providers are least likely to address are those associated with the greatest adolescent morbidity.

Our study findings are similar to studies examining the rates of prevention counseling by providers to adolescents^{6,29,30}. Adolescents report counseling rates of between 20% and 40% for the prevention topics that national guidelines recommend providers address with adolescents and their parents⁶. Similarly to our **findings**, providers **in these studies** appeared to counsel adolescents about high-risk topics, such as sexual activity and substance use, less often than they did about general prevention topics^{29,31}. Taken together, the low counseling rates reported by both parents and adolescents suggest that either provider counseling rates are very low for sensitive topics or that providers are not addressing preventive health concerns (especially around high-risk and mental health topics) in a way that facilitates patient or parent recall.

The correlates of parental reports of counseling discussions with providers varied by prevention topic. There were no correlates of parental reports of discussions about general prevention topics, which parents were most likely to recall discussing. This suggests that providers counsel about general prevention topics fairly uniformly or, at least, in ways most parents can recall. Parental recall of discussions of high-risk topics (e.g., substance use or sexual issues) and mental health topics was higher among parents who believed their adolescent had engaged in more health risk behaviors and those accompanying adolescent girls (high-risk topics only). This implies that parental concerns may influence the delivery (or recollection) of counseling services. **Or perhaps** providers **target** counseling based on assumptions about, or knowledge of, an adolescent's risk profile rather than providing universal prevention education on a broad range of topics.

Tailoring of prevention counseling has advantages. It is **time-efficient**, allowing providers to address the unique needs of adolescents and their families. The disadvantage is this approach may limit adolescents' or their families' access to information that can promote healthy habits. Given that much adolescent morbidity **is due** to engagement in health risk behaviors^{1,32,33}, clinical guidelines recommend that health providers screen adolescents for a broad range of psychosocial and behavioral health issues and provide targeted counseling and referral services at least once annually^{3,19-21}. These guidelines also recommend routine preventive counseling be delivered to parents, but this does not appear to be happening. Given that parents play a critical role in recognizing issues and facilitating access to care, if they are unable to recall the counseling experience, they are most certainly unlikely to use any information that may have been provided.

Several visit-specific characteristics predicted parental recall of discussions about mental health topics. If parents were attending their adolescent's well-child visit or if the study clinic was an adolescent's USOC, parents were more likely to recall having discussed mental health topics. Multiple studies have shown that having a USOC increases the likelihood of receiving recommended preventive services^{34,35}. Our findings—that parents were more likely to recall discussing mental health topics with a provider if the study clinic was their adolescent's USOC—may be an indication that providers are uncomfortable discussing mental health issues with families they do not know well.

These findings should be interpreted in light of several limitations. The sample was recruited from outpatient clinics at a single, urban academic children's hospital. The results may

therefore not be generalizable to clinics in different geographic settings or practice environments. Selection bias may have affected our results since participation was limited to biological parents or legal guardians accompanying an adolescent on the day the questionnaire was completed. Results may differ among children whose parents do not accompany them on clinic visits (such as older adolescents) or those being cared for in other, nontraditional family environments. We used parental report of provider counseling behaviors rather than directly measuring counseling behaviors. Though parental report of provider behavior has been shown to be a valid proxy¹⁷, recall bias may still have affected the results, resulting in underreporting by some participants, overreporting by other participants, or variable reporting of different topics. We assessed counts of prevention-focused conversations. This implies that all conversations are equally effective, which we know is not true. Many factors contribute to the effectiveness of conversations, including the provider's (and parents') comfort in engaging in the discussion; the quality of the conversation; the extent to which the information provided was understood; when, during the clinic visit, the discussion took place; and the extent to which the discussion was a response to parent, youth, or provider concerns. Our approach also implies that the number of topics discussed equates with measuring (or meeting) parents' health service and prevention education needs. We recognize that discussing multiple topics is not the same as discussing the „right' topics. Future research is needed to determine whether providers' counseling discussions are meeting parents' perceived needs and whether counseling improves outcomes for adolescents and their families. Additional confounders include, but are not limited to, variability in the following: parent expectations of providers, ability to recall discussions, variability in the length of time since a discussion with the adolescent's provider, and variability in the amount of time available to complete the questionnaire.

We have taken care, when interpreting our results, to avoid making conclusions that are not supported by the data. This study examined parental recall of provider discussions. Without assessing actual provider behaviors and determining which behaviors engender greater parental recall (or health promoting actions), it is premature to recommend a roadmap for change for providers. Rather, our findings serve as an important first step in a broader research plan designed to understand whether providers are educating the parents of adolescents and what they are educating them about. We hope that our study will stimulate additional research that will better inform provider-parent counseling efforts.

4.2. Conclusion

This is one of the first studies to quantify the delivery of clinical prevention counseling services delivered by health providers to parents of adolescents. Parental report of receipt of adolescent prevention-focused counseling from pediatric providers about the full complement of adolescent preventive health issues was low and varied widely by topic. Recall was lowest for topics associated with the greatest adolescent morbidity, such as sexual health, substance use and abuse, and mental health. Given that much of the morbidity and mortality during adolescence is due to preventable causes that stem from engagement in health risk behaviors or manageable conditions, meeting the preventive health education needs of parents of adolescents is critically important as it will allow us to better support adolescents' health.

4.3 Practice Implications

Our findings support emerging recommendations that the paradigm for delivering adolescent prevention counseling services should be revised. Specifically, our findings suggest that counseling about adolescent preventive health needs to occur more often and in a manner that more parents are likely to remember. However, it is insufficient to simply state that more counseling needs to happen. Rather, it is important to be thoughtful about current innovations that can be capitalized upon to improve delivery of counseling services. One strategy is to upend the traditional pediatric care paradigm that relegates prevention counseling to well-child visits, which few adolescents attend^{12,36}. Incorporating screening and counseling practices into other visit types, such as acute care visits is now recommended, and more efforts to facilitate efficient provision of counseling during these visits are needed¹². **Utilization of decision support tools is another approach for ensuring delivery of high-quality care while optimizing the time allotted for the visit**³⁷. Pre-visit surveys of parents could be used to identify topics most salient to parents to be used to guide discussions. Our findings support the use of these tools as a way to help providers determine which topics parents and their adolescents consider most pertinent for discussion. If integrated into electronic medical record systems, these tools could generate alerts indicating which prevention services have **or have** not yet been covered. Finally, developing print or online education resources tailored for parents of adolescents could improve information delivery while minimizing the impact on visit length and time spent counseling adolescents directly.

I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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Table 1

Sample Characteristics (n=358)*

Characteristic	
Demographic Characteristics	
Mean age, years $\pm$ SD	40.8 $\pm$ 9.2 (Range: 19-78)
Female	318 (89)
Race	
Black	220 (61)
White	120 (34)
Other	16 (4)
Marital Status	
Single, never married	130 (36)
Married	145 (41)
Separated/divorced/widowed	79 (22)
Education	
< High school	112 (31)
Some college	107 (30)
College graduate	100 (28)
Graduate school	36 (10)
Mean child age, years	14.3 $\pm$ 2.1 (Range: 11 - 18)
Accompanying female adolescent	187 (52)
Insurance	
Medicaid	240 (67)
Private	106 (30)
Clinical Care Utilization	
Reason for clinic visit	
Well-child visit	146 (41)
Acute care	51 (14)
Immunization	49 (14)
Sport physical	30 (8)
Gynecology	25 (7)
Routine follow-up	19 (5)
Other	28 (8)
Mean time since last well-child visit (months)	12.8 $\pm$ 22.5 (Range: 0-236 months)
Adolescent has usual source of care (USOC)	308 (86)
Time adolescent with USOC	
< 1 year	46 (13)
1-5 years	84 (24)
>5 years	224 (63)

Characteristic	
Study site is USOC	283 (79)
Parenting Characteristics	
Social support (mean $\pm$ SD)	21.40 $\pm$ 7.06 (Range: 4-48)
Parental monitoring (mean $\pm$ SD)	22.28 $\pm$ 2.66 (Range: 4 - 24)
Parental communication (mean $\pm$ SD)	26.00 $\pm$ 5.48 (Range: 4 - 40)

* Proportions do not sum to 100% where there is missing data.

Table 2

Proportion of Parents who Report Discussing Each Adolescent Preventive Health Topic (n=358)

Topics	N (%)
High Risk Topics	
Abuse (physical, sexual, verbal)	128 (36)
Human Papilloma Virus (HPV)	116 (32)
Alcohol or Drug use	114 (32)
Sexual Development	99 (28)
AIDS	94 (26)
Sexually Transmitted Diseases	79 (22)
Contraception	72 (21)
Dating or Relationships	74 (21)
Condom use or safe sex	72 (20)
Pregnancy	72 (20)
Sexual orientation (homosexuality, bisexuality)	56 (16)
Mental Health Topics	
Behavior problems or discipline	140 (39)
Smoking	123 (34)
Stress	108 (30)
Depression	101 (28)
Suicide	71 (20)
General Prevention Topics	
Nutrition	178 (50)
Exercise/Sports	169 (47)
Safety (seat belt, helmets)	143 (40)
Human Papilloma Virus (HPV) vaccine (Gardasil)	125 (35)
Body Image/Self Esteem	207 (30)

Table 3

Correlates of parental report of discussing preventive health topics* (n=358)

Variables	Model 1 Odds ratio (95% confidence interval)	Model 2 Odds ratio (95% confidence interval)	Model 3 Odds ratio (95% confidence interval)
High Risk Topics			
Parent age	0.998 (0.97, 1.03)	1.00 (0.97, 1.03)	0.99 (0.95, 1.02)
Parent Sex (ref: male)	0.69 (0.31, 1.51)	0.54 (0.22, 1.37)	0.65 (0.23, 1.80)
Race (ref: black)	0.94 (0.61, 1.44)	0.98 (0.59, 1.60)	0.93 (0.53, 1.61)
Marital status (ref: single, never married)	1.10 (0.79, 1.55)	0.92 (0.62, 1.36)	1.11 (0.69, 1.77)
Education (ref: < HS)	1.16 (0.87, 1.53)	1.33 (0.95, 1.85)	1.35 (0.92, 1.97)
Adolescent age (ref: 11-13 years)	1.32 (0.93, 1.85)	1.32 (0.88, 1.98)	1.17 (0.69, 1.96)
Adolescent Sex (ref: male)	1.94 (1.18, 3.19)	1.99 (1.11, 3.55)	2.21 (1.08, 4.50)
Insurance (ref: Medicaid)	0.95 (0.55, 1.63)	1.03 (0.54, 1.98)	1.19 (0.56, 2.52)
Reason for clinic visit (ref: not well-child visit)	---	1.54 (0.86, 2.75)	1.55 (0.76, 3.14)
Time since last well-child visit	---	0.996 (0.99, 1.01)	0.996 (0.98, 1.01)
Has USOC (ref: no)	---	1.25 (0.55, 2.85)	0.75 (0.28, 2.01)
Time with USOC (ref: < 1 year)		1.17 (0.81, 1.71)	1.06 (0.68, 1.66)
Study clinic is USOC (ref: no)	---	1.29 (0.60, 2.79)	1.61 (0.64, 4.04)
Social support	---	---	0.98 (0.93, 1.03)
Parental monitoring	---	---	0.96 (0.81, 1.15)
Parental communication	---	---	1.01 (0.94, 1.08)
Number of perceived adolescent risk behaviors	---	---	1.22 (1.01, 1.48)
Mental Health Topics			
Parent age	1.00 (0.97, 1.03)	1.00 (0.97, 1.04)	0.98 (0.95, 1.02)
Parent sex (ref: male)	0.43 (0.19, 0.97)	0.39 (0.15, 1.05)	0.40 (0.13, 1.20)
Race (ref: black)	1.09 (0.72, 1.66)	1.20 (0.73, 1.97)	1.16 (0.66, 2.04)
Marital status (ref: single, never married)	1.30 (0.94, 1.84)	1.29 (0.87, 1.89)	1.55 (0.99, 2.52)
Education (ref: < HS)	1.06 (0.80, 1.40)	1.25 (0.90, 1.74)	1.28 (0.86, 1.91)
Adolescent age (ref: 11-13 years)	1.01 (0.73, 1.40)	1.02 (0.69, 1.52)	1.25 (0.74, 2.10)
Adolescent Sex (ref: male)	0.70 (0.44, 1.14)	0.81 (0.46, 1.45)	0.98 (0.48, 2.03)

Variables	Model 1 Odds ratio (95% confidence interval)	Model 2 Odds ratio (95% confidence interval)	Model 3 Odds ratio (95% confidence interval)
Insurance (ref. Medicaid)	0.68 (0.40, 1.14)	0.67 (0.36, 1.26)	0.94 (0.44, 1.98)
Reason for clinic visit (ref: not well-child visit)	---	2.28 (1.29, 4.04)	2.38 (1.17, 4.84)
Time since last well-child visit	---	0.99 (0.98, 1.00)	0.99 (0.97, 1.00)
Has USOC (ref: no)	---	0.67 (0.28, 1.56)	0.35 (0.12, 1.01)
Time with USOC (ref: < 1 year)	---	1.06 (0.73, 1.54)	1.37 (0.87, 2.18)
Study clinic is USOC (ref: no)	---	2.12 (1.00, 4.51)	3.45 (1.37, 8.87)
Social support	---	---	0.97 (0.92, 1.02)
Parental monitoring	---	---	1.03 (0.88, 1.22)
Parental communication	---	---	0.96 (0.90, 1.03)
Number of perceived adolescent risk behaviors	---	---	1.23 (1.03, 1.48)
General Prevention			
Parent age	0.99 (0.95, 1.01)	0.98 (0.95, 1.01)	0.98 (0.94, 1.01)
Parent sex (ref: male)	0.92 (0.41, 2.07)	0.90 (0.35, 2.31)	0.96 (0.34, 2.70)
Race (ref: black)	1.08 (0.68, 1.71)	0.93 (0.56, 1.56)	1.06 (0.60, 1.89)
Marital status (ref: single, never married)	1.20 (0.84, 1.73)	1.23 (0.80, 1.87)	1.38 (0.84, 2.29)
Education (ref: < HS)	1.00 (0.74, 1.36)	1.01 (0.71, 1.43)	0.97 (0.65, 1.46)
Adolescent age (ref: 11-13 years)	1.27 (0.89, 1.83)	1.35 (0.88, 2.08)	1.52 (0.86, 2.68)
Adolescent Sex (ref: male)	1.60 (0.94, 2.71)	1.64 (0.88, 3.06)	1.45 (0.69, 3.02)
Insurance (ref. Medicaid)	1.44 (0.79, 2.61)	1.16 (0.57, 2.37)	1.35 (0.61, 3.00)
Reason for clinic visit (ref: not well-child visit)	---	1.26 (0.68, 2.36)	1.19 (0.57, 2.47)
Time since last well-child visit	---	0.996 (0.99, 1.01)	0.997 (0.99, 1.01)
Has USOC (ref: no)	---	1.23 (0.52, 2.93)	0.93 (0.34, 2.56)
Time with USOC (ref: < 1 year)	---	1.40 (0.94, 2.07)	1.43 (0.90, 2.67)
Study clinic is USOC (ref: no)	---	0.70 (0.29, 1.68)	0.62 (0.22, 1.71)
Social support	---	---	0.99 (0.94, 1.04)
Parental monitoring	---	---	1.03 (0.86, 1.23)
Parental communication	---	---	0.99 (0.92, 1.08)
Number of perceived adolescent risk behaviors	---	---	1.03 (0.84, 1.26)

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Model 1 adjusted for parent and child socio-demographic characteristics; Model 2 adjusted for clinic utilization measures. Model 3 adjusted for parenting characteristics and parental beliefs about their adolescent's engagement in risk behaviors.

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